

FOREST INSECT CONDITIONS ON THE DIXIE NATIONAL FOREST  
1966

This is a report of Forest insect activities on the Dixie National Forest during 1966. Material for this report was compiled from aerial survey data, from systematic biological evaluations, and by occasional visits to specific problem areas.

No serious insect problems exist on the Forest during 1966. The most important forest insects were the white fir needle miner, western pine beetle, Douglas-fir beetle, and the pinyon needle scale. Briefly, white fir suffered light to moderate damage by a needle miner in portions of the Forest and in adjoining Bryce Canyon National Park. If the infestation increases in intensity and extent during 1967, control may be recommended. More than one hundred ponderosa pine in recreation areas were killed by the western pine beetle but planned control work should reduce the potential in 1967. Douglas-fir beetle activity dropped to a low level but a slight increase in tree killing can be expected in 1967. Active feeding by a scale insect defoliated pinyon pine in and near the Forest.

White fir needle miner, Epinotia maritana

Since 1963, populations of this needle mining insect have shown a fluctuating but increasing trend in white fir stands in Cougar, Crawford, Podunk and Blubber Creeks in the upper drainages of the East Fork of the Sevier River, and at Rainbow Point and Whiteman Bench in adjoining Bryce Canyon National Park. This area has had a history of repeated needle miner outbreaks, beginning in 1952. At that time the infestation gained momentum until 1957 when natural factors supplemented by a 2,000 acre pilot control test reduced the infestation to a low level.

The needle miner population remained at this tolerable level for several years and it was not until 1963 that significant feeding activity and resultant damage was reported. Since then defoliation increased in 1964, tapered off somewhat in 1965 due to adverse weather conditions during moth flight, but increased again during 1966.

This needle miner is a minute moth that spends most of its life stages within mined needles. One larva mines 5 to 7 needles during its lifetime. Needle miner activity is first noticed by mined needles which turn yellow and white in May, June, and July; and later by swarms of small, grey moths around the host trees in July. As an infestation progresses, tree crowns become thin as a result of needle drop due to mining; twig and branch killing occurs; and in some cases tree mortality may occur. Under repeated, heavy attacks, intermediate and suppressed trees will be the first to succumb.

Equally important, however, is the suspected decline in vigor of the entire affected stand, which may weaken the trees thereby predisposing them to bark beetle attacks. It is believed that this is what occurred during 1959 through 1961, following the 1957 outbreak, when several hundred trees were attacked and killed by fir engraver beetles.



Biological evaluations were made in several areas to determine the degree of defoliation and to provide an indication of population trend. Defoliation ranged from light to medium with the heaviest activity occurring in the East Fork drainages. No current mortality was observed, nor was fir engraver beetle activity noted.

An indication of expected damage can be obtained by systematically collecting foliage samples in the fall following egg hatch, and recording the number of new larval mines and the number of green needles on the past three years growth. Barring any excessive departure from a normal mortality curve, it is possible to predict, with some reservations, of course, the level of activity that can be expected in 1967. Parasites were active in most of these areas this year but we know so little about them, that any attempt to relate their effects on population trend would be pure conjecture. From other measurements, however, it appears that defoliation will intensify and the infestation will increase in size in 1967, particularly in the East Fork drainage, and in the Park at Rainbow Point. If this prediction materializes and the overall infestation maintains its present impetus, control action may be necessary.

#### Western pine beetle, Dendroctonus brevicornis

Western pine beetle activity in ponderosa pine increased considerably over that reported in 1965. In the spring of that year, forty-four infested trees were treated in the Pine Valley recreation area. That fall during the annual aerial detection survey, only three "faders" were observed in this area. In 1966, again during the aerial survey, thirty-to thirty-five current "faders" were recorded. These trees occur singly or in pairs, and are scattered throughout a wide area from the campground to Squaw Canyon. Locating these few trees on such a large area is extremely difficult, consequently, no evaluation was made in this area.

Additional infestations were reported in Browse Creek and in the Oak Grove Campground, this time by Forest personnel. These small, but relatively intense infestations were overlooked during the aerial survey. An evaluation was performed in the Oak Grove Campground but snow prevented an examination of the Browse Creek area.

In and near the Oak Grove Campground an estimated 100 trees, ranging in size from eight to twenty-four inches d.b.h., were infested. These trees could not be generally classified as high risk trees. By removing bark samples and examining the brood it was evident that two generations were present. The majority of the brood were in the egg stage although a few trees contained large larvae. Parasites and predators were present in those trees harboring mature larvae but were less conspicuous in the recently attacked trees containing eggs.

At that time it appeared that parasites and predators were not abundant enough to offset the apparent increasing trend. Winter had not yet had its effect, however, and any prolonged sequence of adverse temperatures



between now and spring could be an important controlling factor. Because of the variable brood conditions, emergence of the overwintering broods will begin in late May and end by the middle of August. It should be recognized that this emergence period is only approximate as temperature largely influences development and emergence.

In summary, the trend of the Oak Grove infestation, and possibly elsewhere, is epidemic and increasing. Barring unforeseen climatic events that might possibly reduce the population potential, a two to three fold increase in the number of trees attacked and killed may occur in 1967 if control is not undertaken.

#### Douglas-fir beetle, Dendroctonus pseudotsugae Hopk.

Douglas-fir beetle activity declined considerably over that recorded in 1965. The large group type infestations that prevailed in many areas of the Forest in 1965 were practically nonexistent in 1966. The reason for this apparent but sudden decline is unknown for no ground examinations were conducted in 1965. The largest, single infestation, involving some 300 "faders", is spread over a three square mile area in steep, inaccessible country bordering Government Creek southwest of Teasdale. Several small, scattered groups of three to ten trees each persist in the East Fork of the Sevier bordering Bryce Canyon National Park. Other, less significant infestations of undetermined potential exist in many of the marginal Douglas-fir sites in other areas of the Forest.

No ground checks or firsthand examinations were made in any of these infestations in 1966; consequently, an evaluation based on systematic data is lacking. Nonetheless, from past experience with similar infestations, under similar conditions, it can be conjectured that tree killing will continue at the same level in 1967 with some increase expected on dry, sub-marginal sites contiguous to active infestations. It is suspected that the long, dry summer of 1966 may have preconditioned individual trees, as well as entire stands, to beetle attacks.

#### Pinyon needle scale, Matsucoccus acalyptus

Serious infestations of the pinyon needle scale occurred in 1966 in the Five Mile Bench area in the Forest, at Iron Springs west of Cedar City, and elsewhere on pinyon pine in certain areas of southern Utah and western Nevada. The history of these infestations is unknown but active scale feeding has been observed in these and other areas since 1958.

This small, relatively inconspicuous scale insect feeds primarily on old growth, but under heavy population pressure they will move to the new expanding foliage. Feeding results in thin crowns caused by premature shedding of the needles. Excessive feeding can kill young trees and predispose older, larger trees to attacks by Ips beetles. Moderate to heavy defoliated trees are, of course, unfit for Christmas tree stock and the reduced vigor may result in a poor cone crop in 1967.



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The infestation at Five Mile Bench covers approximately 200 acres with only the smaller trees harboring scale populations. Some trees were defoliated as much as 50 percent. In the Iron Springs area, overall defoliation averaged 40 percent, while some trees were completely defoliated except for the new growth.

According to present evaluation standards, the infestations at Five Mile Bench and Iron Springs are epidemic. If the scale population maintains its present rate of increase, serious damage and some tree mortality may occur in 1967. Whether the infestation boundaries remain the same or expand is unknown. There is no known control method.

William H. Klein

WILLIAM H. KLEIN, Entomologist